DISCOVER POROSITY: *WHICH HOLDS MORE WATER, SAND OR GRAVEL?*

GROUNDWATER FOUNDATION
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1. Record your estimate of your small plastic cup
   _____

2. Record the amount of water in the cup.
   A. For example, if the syringe initially held 35cc and after filling the cup there are 5cc left in the syringe, the cup holds 30cc.

   Amount of water left in syringe _____ – 35cc=_____

3. Record your estimation of water can be added to the cup filled with gravel. _____

4. Subtract the amount left in the syringe from the initial amount. This is how much water fits in the spaces between the gravel. Record this amount. +

   • Amount of water left in syringe _____ – 35cc=_____

5. Explain which material, sand or gravel, was able to hold more water and why you think so

_____
_____
_____
_____

6. Explain which material, sand or gravel, is more porous.

_____
_____
_____
_____

7. Define porosity:

_____
_____
_____
_____

8. To find the porosity of each material, first determine the volume of material in each cup. *TIP: The volume of sand and gravel in the cup will be equal to the volume of water the cup is able to hold when full. If the cup holds 30cc of water when filled to the rim, the cup will also hold 30cc of sand or 30cc of gravel.*

Volume of water added to the material ÷ total volume of material = **porosity of the material**

Porosity is always expressed as a fraction or percent.

For example, if 15cc of water were added to a cup filled with 30cc of gravel, divide 15 by 30 and multiply by 100 to get a percent. In this example the porosity of the gravel would be 50%.

Material	Porosity

Extension

A. Try the activity again using larger containers. Does the porosity of sand and gravel change?

B. Tap the bottom of the container while adding the sand or gravel in order to compact and settle the material. Does the porosity change when the material is compacted? *TIP: This is best if done in containers larger than the cups provided.*

C. Mix sand and gravel together. Test porosity and compare with results of pure sand and gravel. How does mixing materials affect porosity?

D. Find sands, gravels, and soils with different grain size than provided. Test porosity and compare results. How does grain size affect porosity?